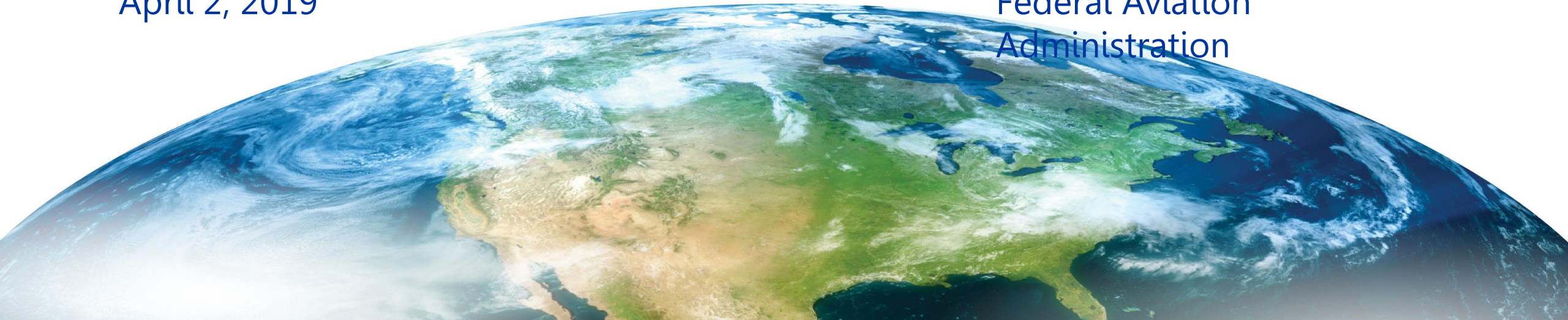




Status of ICAO Space Weather Information

Presented to 2019 Space Weather
Workshop
Boulder, Colorado
April 2, 2019

Dr. William H. Bauman III,
Manager, Aviation Weather
Division, Office of NextGen,
Federal Aviation
Administration



Overview

- ICAO Meteorology Panel
- Background of ICAO Space Weather Provision
- Status of ICAO Space Weather Provision
- Designated ICAO Space Weather Centers
- Space Weather Manual
- New Regulations?
- Summary
- Point of Contact



ICAO Meteorology Panel (METP)

- A technical body of qualified experts
- Established by ICAO's Air Navigation Commission (ANC)
- Responsible for development and maintenance of standards, recommended practices and procedures for meteorological service for international air navigation
- METP reports directly to the ANC
- Consistent with the work program of the METP and other ICAO Panels, METP meetings review, discuss and formulate recommendations and decisions on a broad spectrum of technical areas concerning aeronautical meteorological service provision including space weather



Background - Space Weather Work Stream

2015

MET Panel Develops Standards and Recommended Practices (SARPs) for Space Wx for Amd 78
Apr 2015 – Oct 2016

2016

ANC Approves SWx SARPs and Selection Criteria
Nov 2016 – Mar 2017

2017

ICAO Invites States to Provide SWx Information
Jun 2017 – Sep 2017

2018

WMO Audits Potential SWx Providers
Oct 2017 – Apr 2018

ICAO Designates SWx Providers
Nov 2018

2019

Center Coordination, Dissemination, & Governance Ad Hoc Group

Service begins Nov 7, 2019

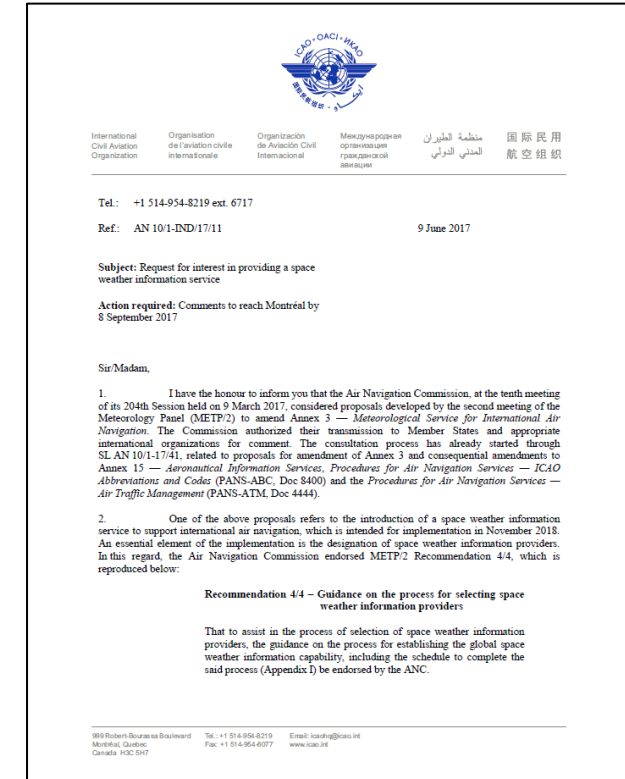


METEOROLOGY PANEL



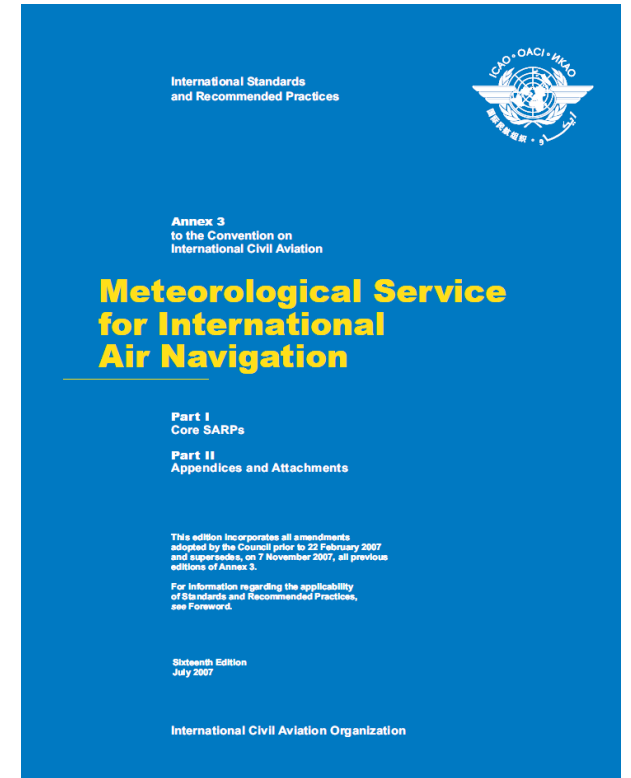
Background

- Phases to designate ICAO Space Weather Provider(s)/Center(s)
 - ICAO issued State Letter AN 10/1-IND/17/11 on Jun 9, 2017 requesting States to provide a formal expression of interest in providing the space weather information service
 - WMO conducted an audit of all States and consortia that indicated a formal interest
 - Audit against criteria developed by MET Panel (accepted by ANC)
 - Did not assess the 'quality' of meeting criteria
 - Did not make a judgment (e.g., ranking) of States - only reported results of States' meeting or not meeting the identified criteria
- ICAO Council selects/designates States to provide Space Weather Annex 3 products in Nov 2018
 - Based on 'optimum number' recommended by METP
 - Based on WMO audit results
 - Based on 'other' considerations



Status of Provision

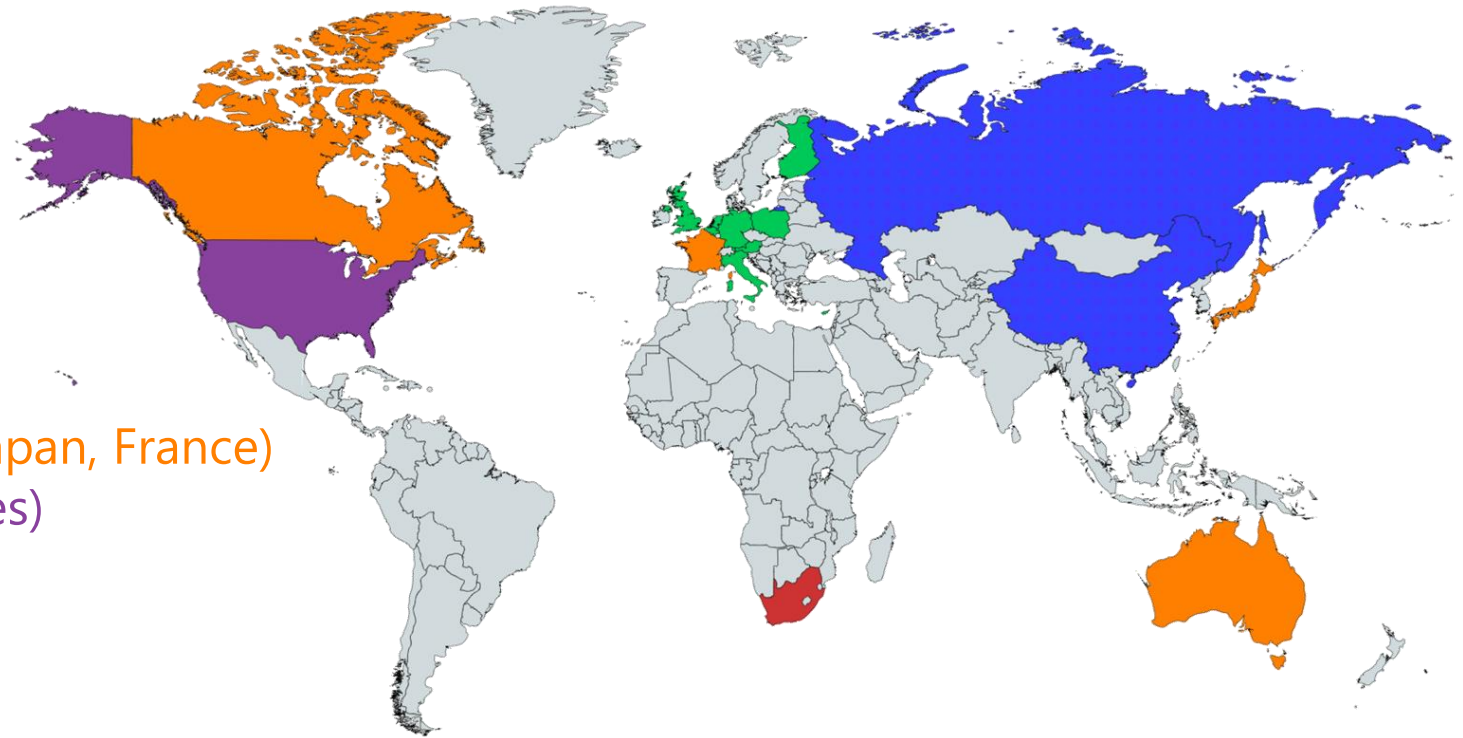
- Annex 3 to the Convention on International Civil Aviation, "Meteorological Service for International Air Navigation" Amendment 78
 - Adopted 2016
 - Effective Nov 8, 2018*
 - Issue advisories for
 - HF Voice/Data & Satellite Communications
 - Radiation Exposure to Crew & Passengers
 - GNSS Based Navigation & Surveillance



*Yes, we are technically late, but ICAO did not make center selections until Nov 2018. Implementation underway

ICAO Centers

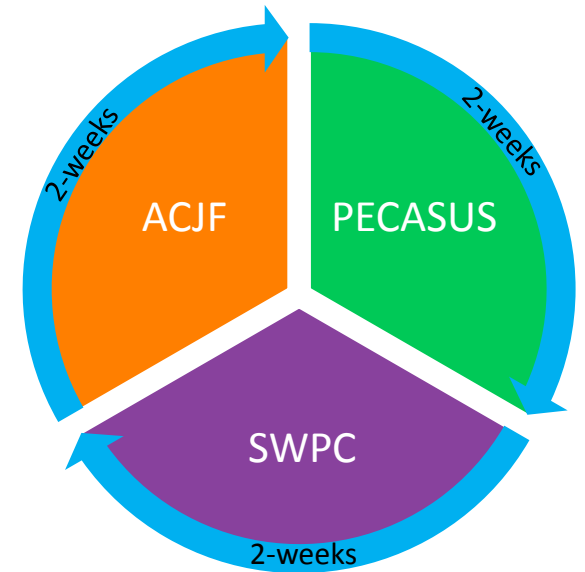
- Designated ICAO Centers
 - Three Global – Consortiums are considered one center
 - PECASUS (European consortium lead by Finland)
 - Finland
 - United Kingdom
 - Germany
 - Austria
 - Poland
 - Italy
 - Netherlands
 - Belgium
 - Cyprus
 - ACJF (Australia, Canada, Japan, France)
 - NOAA SWPC (United States)
 - Two Regional
 - China/Russia Consortium
 - South Africa



*Numbers do not reflect ranking or order
All centers equal in their designation

ICAO Centers

- Global Centers working to meet Annex 3 Global provision → operational Nov 7, 2019
- One 'On Duty' Center at any given time
 - Two-week rotation
 - 'On Duty' Center issues all advisories
 - Centers coordinate and collaborate continually
 - Other two centers ready for 1st and 2nd backup
- Regional Centers operational by 2022
 - Sooner if feasible



ICAO Centers

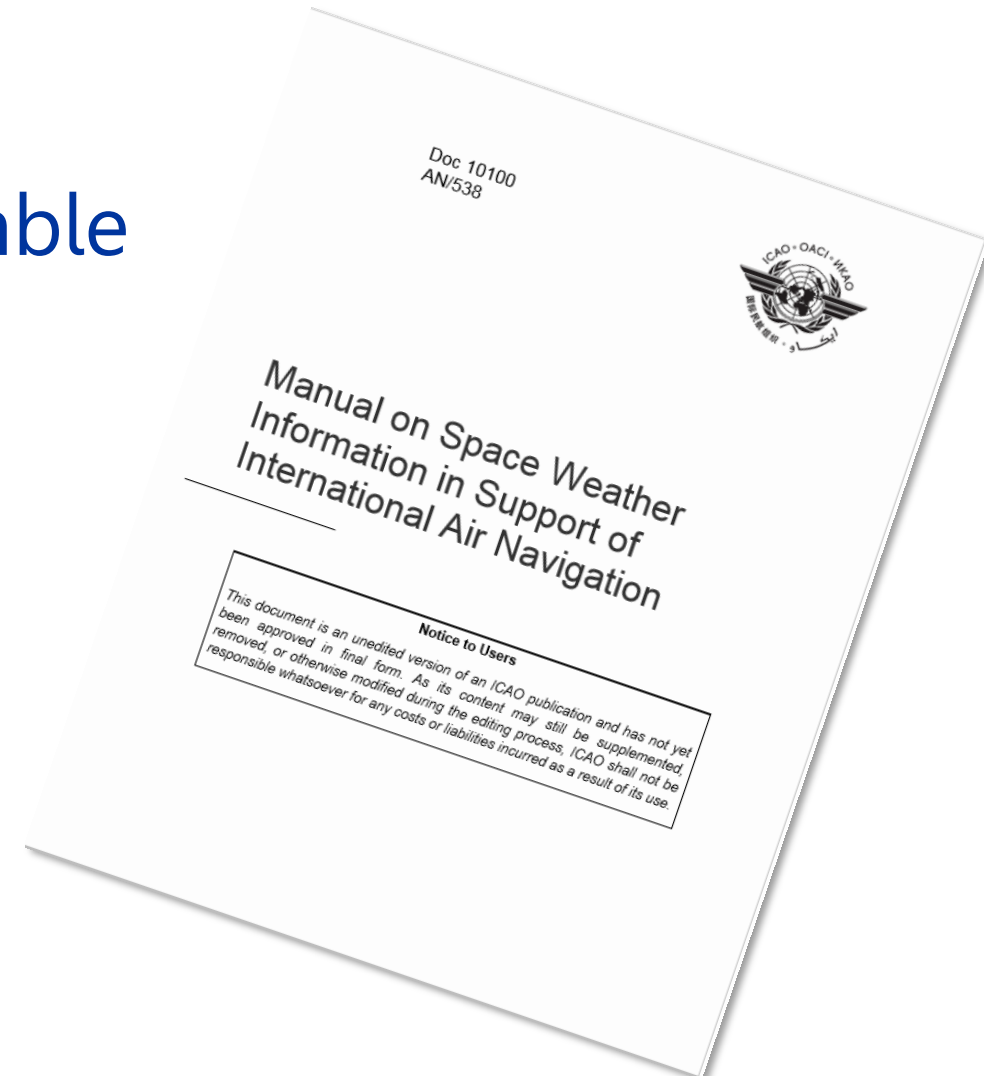
- SWPC and other countries have produced space weather information for years
 - Not necessarily specific to aviation needs and decisions
- ICAO Annex 3 Space Weather Advisories intended to meet the needs of 192 ICAO member States, and over 200 airlines globally
 - Provides a standardized product and service
 - Can be supplemented with more detailed space weather information as needed



Space Weather Manual

- Space Weather Manual V1.0 available soon
 - V2.0 Dec 2020
- Other Guidance Material
 - Center Rotation & Operations
 - Advisory Interpretation and Use

<https://www.icao.int/airnavigation/METP/Panel%20Documents/Doc.10100.Space%20Weather%20Manual%20FINAL%20DRAFT%20Version.pdf>



United States Regulations

- FAA not planning any new regulations, or changes to current regulations around ICAO Space Weather Advisories
- How individual airlines use Space Weather Information can be defined in their Operations Specifications



Summary

- Described ICAO METP function
- Discussed the background and status of the ICAO Space Weather Provision
- Reviewed and described the status of the three global and two regional ICAO Space Weather Centers
- Updated the status of the Space Weather Manual
- Noted the FAA is not planning to introduce and new regulations



For More Information

- FAA Point of Contact
 - Pat Murphy
 - michael.murphy@faa.gov
 - Manager, Policy & Requirements Branch, Aviation Weather Division, FAA, NextGen
- U.S. Member to ICAO Meteorology Panel (METP)
 - Rapporteur to METP WG-Meteorological Information Service Development
 - Coordinator for Space Weather Work Stream, METP, WG-MISD

